HEPATITIS TYPE B (HBV)

(Serum hepatitis; Australia antigen hepatitis [both terms are obsolete]. See also **HEPATITIS TYPE B, PERINATAL**)

1. **Agent**: Hepatitis B virus (HBV), several subtypes.

2. **Identification**:

   a. **Symptoms**: Onset is often insidious. Symptoms include fatigue, anorexia, vague abdominal discomfort, joint pain, nausea, vomiting, and jaundice; when present, fever may be mild. Many cases are asymptomatic.

   b. **Differential Diagnosis**: Other causes of viral and non-viral hepatitis.

   c. **Diagnosis (new definition as of January 1, 2012)**

      Acute: HBsAg positive and HBc IgM positive (if done) *and* evidence of illness with (1) discreet onset of symptoms *and* (2) jaundice *or* elevated aminotransferase levels >100.

      Chronic/Carrier: No symptoms are required with chronic hepatitis B virus infection. HBc IgM negative AND a positive result on one of the following tests: HBsAg, HBeAg, or HBV DNA positive OR HBsAg or HBV DNA, or HBeAg positive 2 times at least 6 months apart.

3. **Incubation**: From 45-180 days; usually 60-90 days.

4. **Reservoir**: Human.

5. **Source**: Primarily blood to blood and sexual contact.

6. **Transmission**: By parenteral inoculation or mucosal membrane exposure to human blood or blood products. Susceptible sexual partners of infected persons are at risk. Perinatal transmission is likely to unprotected (no HBIG or vaccine) infants of HBsAg-positive mothers.

7. **Communicability**: Blood is potentially infective before and after onset of symptoms. Approximately 2-10 percent of acute adult cases become carriers. Ninety percent of infected infants become carriers.

8. **Specific Treatment**: None for acute stage. Antiviral medications may be beneficial for chronic disease.

9. **Immunity**: Lifelong

REPORTING PROCEDURES

1. Reportable, *California Code of Regulations*, Section 2500 and 2505.

2. **Report Form**:
   VIRAL HEPATITIS B or C CASE REORT

   In addition, for the rare case associated with administration of blood or blood products during the 6-month period prior to onset, use Supplemental Data Sheet, **TRANSFUSION-ASSOCIATED HEPATITIS CASE RECORD (CDPH 8376)**.

3. **Epidemiologic Data**:

   a. Record results of laboratory tests: HBsAg, IgM anti-HBc, HAV IgM, anti- HCV, ALT levels etc.

   b. Reason for medical visit leading to diagnosis. This may be helpful in determining if case is acute or chronic hepatitis B.

   c. Contact with confirmed or suspected acute or chronic hepatitis B infection

   d. Patient was treated for a sexually transmitted disease.

   e. Patient or employee of a renal dialysis unit.

   f. Resident of a long term facility (e.g. nursing home).

   g. Receive fingersticks.

h. Contact with or injection of contaminated blood; accidental inoculation by needle (laboratory), accidental splash into the eye.

i. Transfusions of blood or blood products: places, dates, lot numbers, manufacturer.

j. Patient has received any IV infusions and/or injections in the outpatient setting.

k. Medical or dental treatment within past 6 months, including types of injections, surgical procedures performed or any diagnostic medical procedure.

l. Occupational history, especially medical-dental personnel, workers or public safety worker (law enforcement/correctional officer) and those involved in handling blood or blood products.

m. Blood donation, date, and location of last donation.

n. Patient has undergone acupuncture.

o. Percutaneous exposure: self-injections (admitted or suspected), tattooing, ear piercing, acupuncture, electrolysis, skin-piercing procedures, etc.

p. Use of injection or non-injection street drugs.

q. For infant or child case, status of mother and other sibling should be evaluated. If pertinent, testing of mother's long-term sexual partner may be considered at the discretion of the mother's physician and child's mother.

r. Number of sexual partners of either gender.

CONTROL OF CASE, CONTACTS & CARRIERS

Investigate acute cases within 3 days. The **VIRAL HEPATITIS B or C CASE REORT** is for acute cases only. For chronic carriers submit a CMR only.

CASE:

No restrictions.

CONTACTS:

Persons exposed to blood of an infected person, regular sexual partners and household contacts.

1. No restrictions.

2. Hepatitis B immune globulin (HBIG) is indicated in non-immune persons for post-exposure prophylaxis following accidental needle stick or mucosal (eye or mouth) exposure to blood positive for HBsAg. For specific details, refer to *MMWR*, December 26, 1997, Vol. 46, No. RR-18. Immunization of Health-Care Workers: Recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC).

3. Acute hepatitis B or an asymptomatic carrier state during pregnancy or during the first 2 months postpartum is frequently associated with later infections in the newborn infant. Refer to *Recommendations for Use and Storage of Common Immunobiologics and Other Prophylactic Agents* (B-71) for prophylaxis details.

4. Regular sexual partners are at increased risk of acquiring HBV infection. Refer to B-71 *Recommendations for Use and Storage of Common Immunobiologics and Other Prophylactic Agents* for prophylaxis details.

5. Hepatitis B vaccine is part of routine childhood vaccination series. Hepatitis B vaccine is recommended for people in high-risk situations and occupations. Refer to B-71, *Recommendations for Use and Storage of Common Immunobiologics and Other Prophylactic Agents*, for details.

CHRONIC/CARRIERS:

Defined as any person HBsAg or HBV DNA, or HBeAg positive 2 times at least 6 months apart.

1. Pregnant women who test positive for HBsAg should be referred to Perinatal Hepatitis B Prevention Unit.

2. No restrictions. Carriers are not to be excluded from work or school solely on the basis of a positive HBsAg (including health care work).

3. A carrier of HBsAg may or may not be symptomatic.

4. Those with a positive HBsAg test should be informed, evaluated for the presence of liver disease, and followed to determine persistence of antigen.

5. Stress routine precautions, such as those applying to prevention of transmission via percutaneous and sexual routes.

6. Recommend evaluation of contacts for immunity and vaccination if needed.

PREVENTION-EDUCATION

1. Advise that disease may be transmitted by shared articles that become contaminated with blood (needles, syringes, razors, toothbrushes).

2. Advise that regular sexual partners may be at increased risk for hepatitis B. Advise of need for HBIG and/or vaccine. Use of condoms may reduce the risk to sexual partners. A county sponsored vaccine program is available to contacts <19 years.

3. Individuals at continued risk for acquiring hepatitis B infection (occupation, male homosexuals) should be recommended to receive hepatitis B vaccine if not immune. See *Recommendations for Use and Storage of Common Immunobiologics and Other Prophylactic Agents* (B-71).

4. Usage of HBIG based on exposure (type and time) and susceptibility.

5. Instruct on sanitary disposal of blood and other body secretions.

6. Advise patient that persons with a history of viral hepatitis are excluded from blood donor programs.

7. Advise case that HBsAg test should be repeated at 3 and 6 months. If still positive after 6 months, then the patient is considered a carrier and should be evaluated for the possibility of active liver disease.

DIAGNOSTIC PROCEDURES

Clinical and epidemiological history required to aid laboratory in test selection.

Serology:

Container: Serum separator tube (SST, a red-gray top vacutainer tube) and test request form.

Laboratory Form: **TEST REQUISITION FORM (H-3021)**

Examination Requested: Hepatitis B (indicate if previously positive). Note that PHL only performs anti-HBc IgM upon special request.

Material: Whole clotted blood.

Amount 8-10 ml.

Storage: Refrigerate.

HEPATITIS B SEROLOGY TERMINOLOGY

Serologic Component	Interpretation
HBsAg= Surface antigen	Infectious, acute or chronic.
anti-HBs = Antibody to surface antigen	Resolved infection or vaccine response.
anti-HBc total = Total antibodies (IgG+IgM) to core protein antigen	Either acute, chronic, or resolved disease.
anti-HBc IgM = IgM antibodies to core protein	Acute or recently infected. Rarely positive in chronic carriers.
HBeAg = e-enzyme antigen	Highly infectious, acute or chronic.
anti-HBe = total antibodies to e-enzyme antigen (no distinction made for IgM and IgG)	Useful only for +HBsAg cases: if anti-HBe present, less infectious.

TABLE 3. Recommended postexposure prophylaxis for exposure to hepatitis B virus

Vaccination and antibody response status of exposed person	Treatment when source is		
	Source HBsAg * positive	Source HBsAg negative	Source unknown or not available for testing
Unvaccinated:	HBIG + x 1; initiate HB vaccine series &	Initiate HB vaccine series	Initiate HB vaccine series
Previously vaccinated:			
Known responder @	No treatment	No treatment	No treatment
Known non-responder	HBIG x 1 and initiate revaccination or HBIG X 2	No treatment	If known high-risk source, treat as if source were HBsAg positive
Antibody response unknown	Test exposed person for anti-HBs **	No treatment	Test exposed person for anti-HBs
	1. If adequate @, no treatment is necessary		1. If adequate @, no treatment is necessary
	2. If inadequate @, HBIG x 1 and vaccine booster		2. If inadequate @, administer vaccine booster and recheck titer in 1-2 months

* Hepatitis B surface antigen.
\+ Hepatitis B immune globulin; dose 0.06 mL/kg intramuscularly.
& Hepatitis B vaccine.
@ Responder is defined as a person with adequate levels of serum antibody to hepatitis B surface antigen (i.e., anti-HBs** $\geq$ 10 mIU/mL); inadequate response to vaccination defined as serum anti-HBs <10 mIU/mL.
** Antibody to hepatitis B surface antigen.

MMWR December 26, 1997 / 46(RR-18);1-42. Immunization of Health-Care Workers: Recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC), table 3.